## **ABSTRACT OF THE INVENTION**

The present invention relates to compositions comprising semi-crystalline  $\beta$ -1-4-N-acetylglucosamine polymers (p-GlcNac) and methods utilizing such polymers modulation of vascular structure and/or function. The compositions and methods disclosed are useful for stimulating, in a p-GlcNac concentration-dependent manner, endothelin-1 release, vasoconstriction, and/or reduction in blood flow out of a breached vessel, as well as for contributing to or effecting cessation of bleeding. The methods of the present invention comprise topical administration of materials comprising semi-crystalline p-GlcNac polymers that are free of proteins, and substantially free of single amino acids as well as other organic and inorganic contaminants, and whose constituent monosaccharide sugars are attached in a  $\beta$ -1-4 conformation.

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